Effect of chair types on work-related musculoskeletal discomfort during vaginal surgery

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Background

Evidence supports that surgeons are at high risk for work-related musculoskeletal disorders.

Objective

The objective of the study was to compare the effect of different chairs on work-related musculoskeletal discomfort for surgeons during vaginal operations.

Study Design

This crossover study randomly assigned 4 surgeons to 4 chair types using a 4 × 4 Latin square model: a conventional round stool, a round stool with a backrest, a saddle chair with a backrest, and a Capisco chair. Subjective assessments of surgeon discomfort were performed with a validated body discomfort survey, and workload was assessed with the surgical task load index. The objective postural load was quantified with inertial measurement units of the modified rapid upper limb assessment limits. Subjective and objective assessments of chair comfort were performed with an 11 point scale and seat interface pressure—mapped distributions, respectively. The primary outcome was the difference in body discomfort scores between pre- and postsurgery measurements. Secondary outcomes were the differences in chair comfort scores, postural load, and seating interface pressure—mapped distribution. For each outcome, comparisons among the chair types were based on fitting a linear mixed model that handled the surgeon as a random effect and the chair type as a fixed effect.

Results

Data were collected for 48 vaginal procedures performed for pelvic organ prolapse. Mean (SD) duration of surgery was 122.3 (25.1) minutes. Surgeons reported body discomfort during 31 procedures (67.4%). Subjective increase in discomfort from the preoperative state was noted most commonly in the lower back (n = 14, 30.4%), followed by right shoulder (n = 12, 26.1%), upper back (n = 8, 17.4%), hips and buttocks (n = 7, 15.2%), left shoulder (n = 6, 13.0%), right or left thigh (n = 6, 13.0%), and neck (n = 6, 13.0%). Pre- and postsurgery body discomfort scores did not differ with respect to chair type. Chair discomfort scores for the round stool and the saddle chair were significantly higher than the round stool with backrest and the Capisco chair ($P < .001$). Although the average modified rapid upper limb assessment postural scores showed moderate to high musculoskeletal risk of neck and shoulder discomfort across the 4 surgeons; chair type did not affect postural scores. The saddle chair had significantly reduced dispersion of seated pressure vs the round stool with backrest ($P \leq .001$), depicted by the number of cells with pressure values >5 mm Hg. An increased dispersion of pressure across the chair surface was associated with increased comfort (Spearman correlation, 0.40, $P = .006$) (Figure).

Conclusion

Musculoskeletal strain and associated discomfort for surgeons are very high during vaginal operations. Chair type can affect comfort, and chairs with more uniform distribution and fewer pressure points are more comfortable. However, the chair type used in surgery did not influence the musculoskeletal postural load findings. ■

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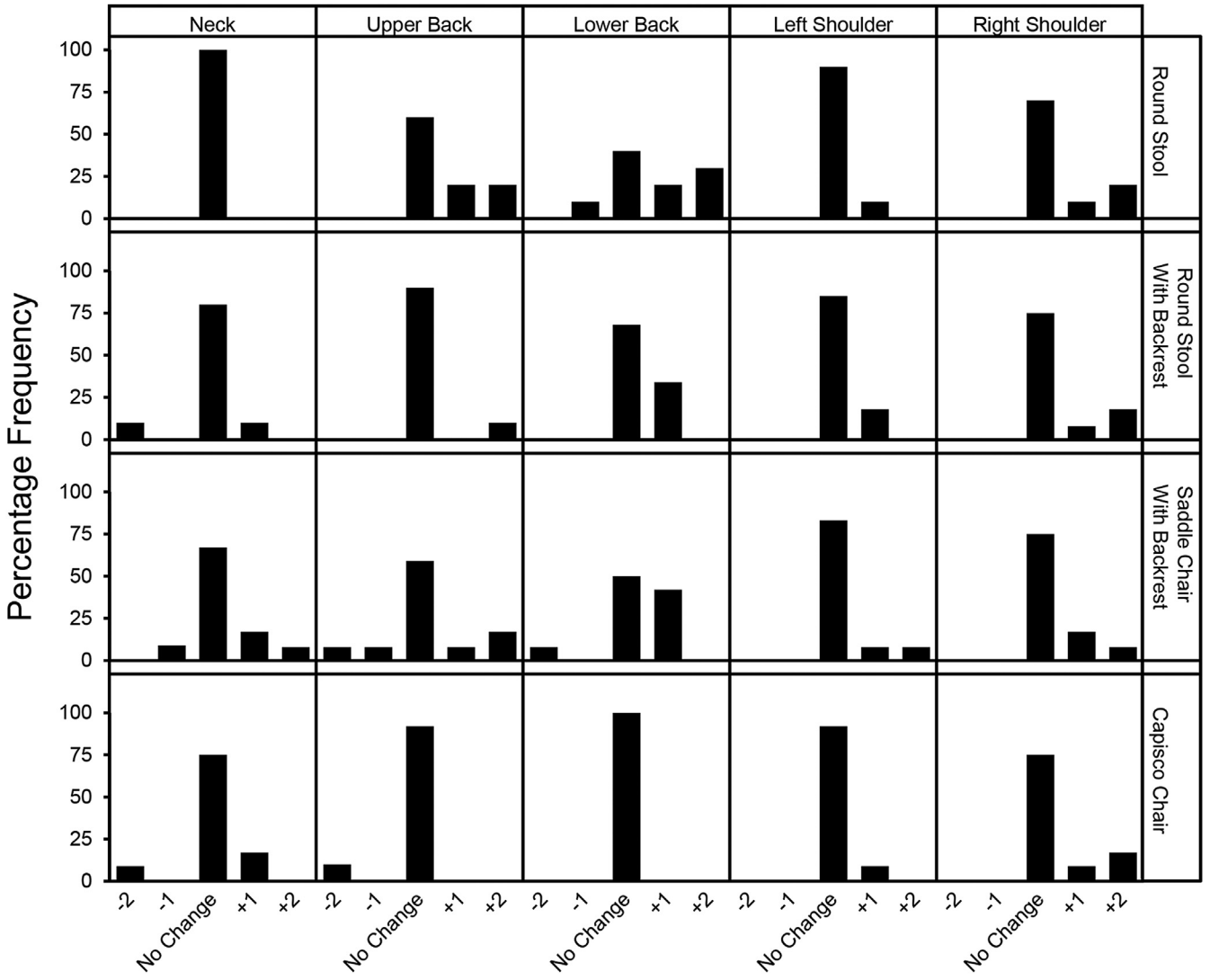
Supporting material appears on the next page

FIGURE
Change in discomfort scores for selected body parts by chair type



Change in Cornell Musculoskeletal Discomfort Questionnaire ratings for discomfort in selected body parts before and immediately after surgery by chair type used is shown. For the change in discomfort rating before vs after surgery, −2 or −1 indicates less discomfort after surgery; +2 or +1 indicates more discomfort after surgery.

Singh et al. Chair types during vaginal surgery. Am J Obstet Gynecol 2016.